

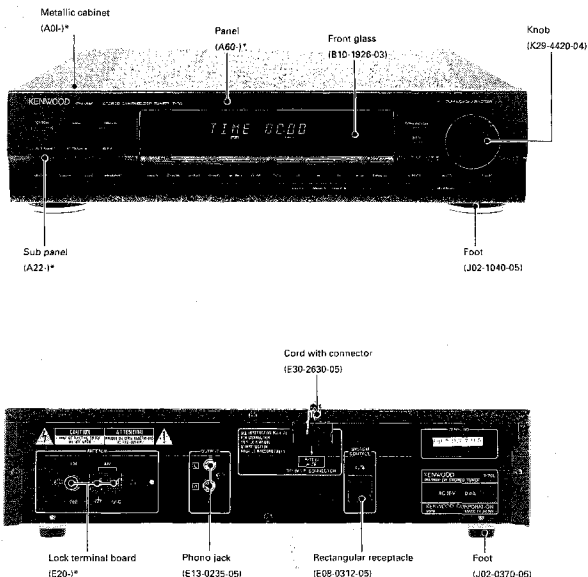
FM/MW/LW STEREO SYNTHESIZER TUNER

T-76/76L

SERVICE MANUAL

KENWOOD

©1992-7 PRINTED IN JAPAN
B51-4610-00(J)2385



T-76 and T-76L don't have a power supply transformer.
Use A-56, A-76 or RM-90PS power supply to supply power
if neither is available, adjust to operate as instructed on
page 8.

When turning the power on, short the connector pin of CN201 (X05-B/2).

*Refer to parts List on page 25.
Photo is T-76L.

T-76/76L

CONTENTS/ACCESSORIES






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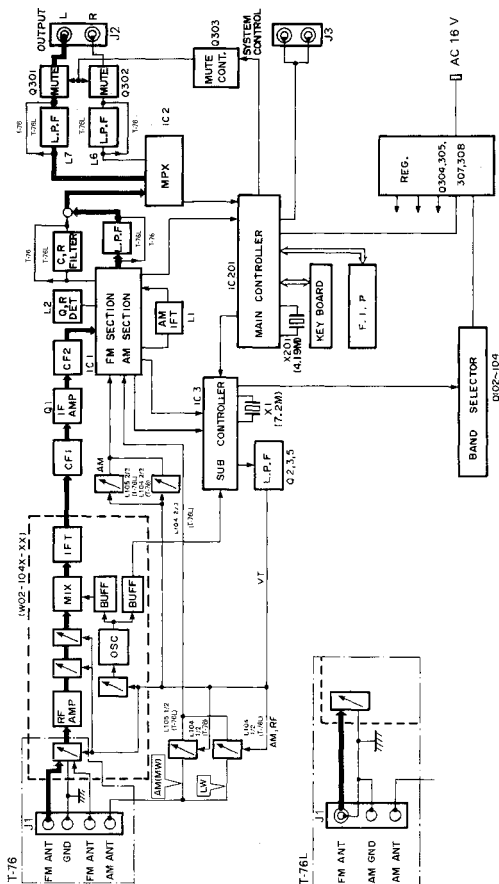
	JAPAN MADE	SINGAPORE MADE	FRANCE MADE
T-76	X05-4320-20(M) X05-4320-71(X)	X05-4330-20(M) X05-4330-71(X)	—
T-76L	X05-4322-71(T,E)	X05-4332-71(T,E)	X05-4322-72(E)

The T-76 and T-76L are made in different countries. However, their circuits are identical.

Accessories

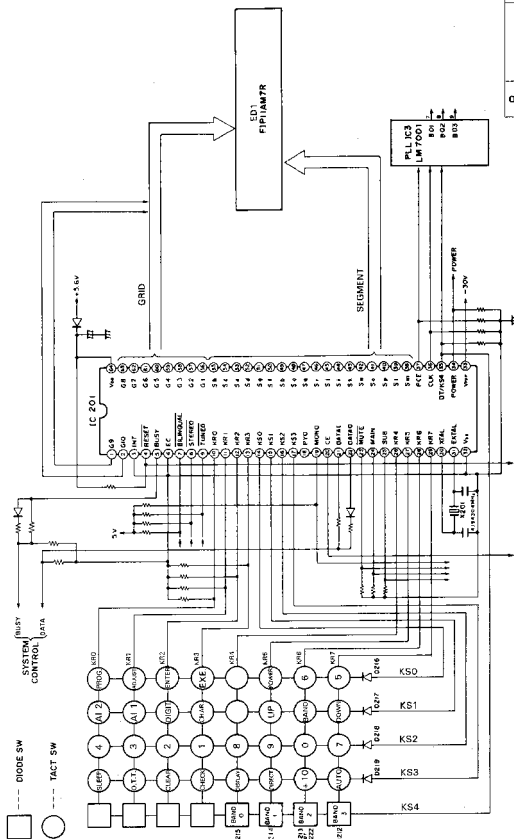
<p>LOOP ANTENNA (T90-0153-05): FRANCE MADE</p> 	<p>T TYPE ANTENNA (T90-0176-05): JAPAN MADE (T90-0176-05): FRANCE MADE (T90-0175-05): SINGAPORE MADE</p> 
<p>LOOP ANTENNA (T90-0173-05): JAPAN MADE (T90-0174-05): SINGAPORE MADE</p> 	<p>ANTENNA ADAPTER (T90-0185-05): (T-76L ONLY)</p>  <p>ANTENNA HOLDER (J19-2815-04)</p> 

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Blockdiagram of surrounding microprocessor (CXP50216-104S: IC201)



BAND SELECT

DISTINCTION	BAND	7pin	8pin	9pin
J	FM	L	H	L
	AM	L	L	H
	VHF	L	H	L
	VHF	H	H	H
	UHF	H	L	L
Other	FM	H	H	L
	AM	H	L	H
	LW	L	H	H

CIRCUIT DESCRIPTION

Pin functions

Pin No.	Pin name	I/O	Name	Operation description
1, 2	T1, T0	O	G9, G10	FL grid output 9G, 10G
3	INT	I		No use (GND)
4	RST	I	RESET	Reset input H: NORMAL L: RESET
5	ADI/FB3	I/O	BUSY	System control BUSY input/output
6	EC	I		No use (GND)
7	SC/PX0	I	BIL	BILINGUAL H: NORMAL L: BILINGUAL
8	SO/PX1	I	STEREO	Stereo signal input H: MONO L: STEREO
9	SI/PX2	I	TUNED	Tuning signal input H: NO L: TUNED
10~13	PF0~PF3	I	KR0~KR3	Key return input H: ON L: OFF
14~17	PE0~PE3	O	KS0~KS3	Key scan output H: ON L: OFF
18	PY0	O		No use (OPEN)
19	PWM/PY1	O	MONO	Forced MONO output H: MONO L: STEREO
20	WP/PY2	I	CE	AC OFF detection input H: AC ON L: AC OFF
21	RMC/PY3	I	DATAI	System control DATA input
22	PD0	O	DATAO	System control DATA output
23	PD1	O	MUTE	Line mute H: MUTE OFF L: MUTE ON
24	PD2	O	MAIN	No use
25	PD3	O	SUB	No use
26~29	PC0~PC3	I	KR4~KR7	Key return input H: ON L: OFF
30	XTAL			Quartz oscillator 4.194304MHz
31	EXTAL			Quartz oscillator 4.194304MHz
32	Vss			GND pin
33	Vreg			-30 V
34	PH0/S0	O	POWER	POWER ON/OFF control H: ON L: OFF
35	PH1/S1	O	DT/KS4	PLL DATA output Key scan output for destination SW
36	PH2/S2	O	CLK	PLL CLOCK output
37	PH3/S3	O	PCE	PLL CE output
38~55	PG0/S4~S23/TR	O	Sm~Sh	FL segment output (m, l, p, o, n, k, i, j, r, q, a, b, f, g, d, e, c, h)
56~63	S22/TR~T2	O	G1~G8	FL grid output 1G~8G
64	Vcc			+5 V (Power supply)

CIRCUIT DESCRIPTION

Test mode

- (1) Method of setting
While pressing the DOWN key, turn AC ON.
- (2) Contents
Power ON
FL all lit
Test frequency setting (Table 1)
- (3) Method of canceling
Clearing the FL all lit state is performed by numeral key,
BAND key, UP/DOWN key or POWER key.

Initial status setting (reset)

- (1) Method
While pressing the ENTER key, turn AC ON.
- (2) Contents
The all memory is cleared and the initial status is fully restored. At this time, however, test frequency is newly memorized in the preset memory. (Table 1)

Preset channel	Destination		T-76		T-76L	
			J TYPE	M, X TYPE	T, E TYPE	
01ch	FM	83.5 MHz	FM	98.0 MHz	FM	98.0 MHz
02ch	FM	90.0 MHz	FM	108.0 MHz	FM	108.0 MHz
03ch	AM	630 kHz	AM	630 kHz	AM	630 kHz
04ch	AM	990 kHz	AM	990 kHz	AM	990 kHz
05ch	AM	1440 kHz	AM	1440 kHz	AM	1440 kHz
06ch	AM	1602 kHz	AM	1602 kHz (AM 1610 kHz)	AM	1602 kHz
07ch	TV	3 ch	FM	87.5 MHz	LW	162 kHz
08ch	TV	8 ch	FM	87.5 MHz	LW	216 kHz
09ch	TV	35 ch	FM	87.5 MHz	LW	270 kHz
10ch	FM	89.1 MHz	FM	89.1 MHz	FM	89.1 MHz
11ch	TV	1 ch	FM	87.5 MHz	LW	261 kHz
12ch	TV	3 ch	FM	87.5 MHz	FM	87.5 MHz
13ch	TV	4 ch	FM	87.5 MHz	FM	87.5 MHz
14ch	TV	8 ch	FM	87.5 MHz	FM	87.5 MHz
15ch	TV	12 ch	FM	87.5 MHz	FM	87.5 MHz
16ch	TV	13 ch	FM	87.5 MHz	FM	87.5 MHz
17ch	TV	35 ch	FM	87.5 MHz	FM	87.5 MHz
18ch	TV	62 ch	FM	87.5 MHz	FM	87.5 MHz
19ch	FM	76.0 MHz	FM	87.5 MHz	FM	87.5 MHz
20ch ~ 30ch	FM	76.0 MHz	FM	87.5 MHz	FM	87.5 MHz

(Table 1)

Conditions by destination

Destination type	Destination switches				Band	Receiving frequency range	Inter-channel space	Intermediate frequency	PLL reference frequency
	B3	B2	B1	B0					
T-76	J	0	0	0	FM	76.0 ~ 90.0 MHz	100 kHz	- 10.75 MHz	25 kHz
					AM	531 ~ 1602 kHz	9 kHz	+ 450 kHz	9 kHz
					TV	1 ~ 62ch	6 MHz	- 10.75 MHz	25 kHz
	M	1	1 or 0	1	FM	87.5 ~ 108.0 MHz	100 kHz or 50 kHz	+ 10.7 MHz	50 kHz
					AM	531 ~ 1602 kHz or 530 ~ 1610 kHz	9 kHz or 10 kHz	+ 450 kHz	10 kHz
	K,P	1	0	0	FM	87.5 ~ 108.0 MHz	100 kHz	+ 10.7 MHz	50 kHz
T-76L	X	1	1	0	AM	530 ~ 1700 kHz	10 kHz	+ 450 kHz	10 kHz
					FM	87.5 ~ 108.0 MHz	50 kHz	+ 10.7 MHz	50 kHz
					AM	531 ~ 1602 kHz	9 kHz	+ 450 kHz	9 kHz
	T,E	1	1	0	FM	87.5 ~ 108.0 MHz	50 kHz	+ 10.7 MHz	50 kHz
					MW	531 ~ 1602 kHz	9 kHz	+ 450 kHz	9 kHz
					LW	153 ~ 261 kHz	1 kHz	+ 450 kHz	1 kHz

ADJUSTMENT

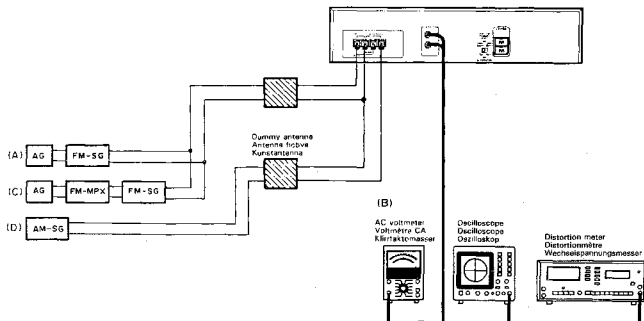
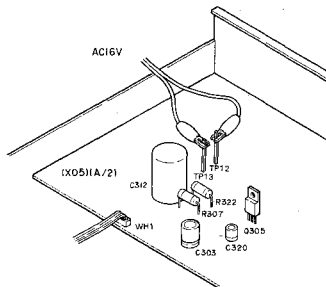
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
FM SECTION		SELECTOR: FM					
1	DISCRIMINATOR	(A) 98.0MHz 1kHz, ± 75 kHz dev (M, X type) 1kHz, ± 40 kHz dev (E, T type) 60dBu (ANT input)	Connect a DC voltmeter between TP3 and TP4. (X05-)	AUTO or MONO 98.0MHz	L2 (X05-)	0V	(a)
2	VCO	(A) 98.0MHz 0 dev 60dBu (ANT input)	Connect a frequency counter to TP5 and TP6 (GND). (X05-)	AUTO 98.0MHz	VR2 (X05-)	19.00kHz	(b)
3	DISTORTION (STEREO)	(C) 98.0MHz 1kHz, ± 88.25 kHz dev Pilot: ± 7.5 kHz dev (M, X type) 1kHz, ± 40 kHz dev Pilot: ± 6 kHz dev (E, T type) 60dBu (ANT input)	(B)	MONO 98.0MHz	1P7 (X02-)	Minimum distortion	
4	SEPARATION (E, T type only)	(C) 98.0MHz 1kHz, ± 40 kHz dev Pilot ± 6 kHz dev Selector: L or R 60dBu (ANT input)	(B)	AUTO 98.0MHz	VR4 (X05-)	Minimum crosstalk	
5	TUNING LEVEL	(A) 98.0MHz 1kHz, ± 75 kHz dev (M, X type) 1kHz, ± 45 kHz dev (E, T type) 14dBu (ANT input) 750 18dBu (ANT input) 3000	(B)	AUTO or MONO 98.0MHz	VR1 (X05-)	Adjust VR1 and stop at the point where EDI(TUNED) goes on.	
AM (MW) SECTION		SELECTOR: AM(MW)					
(1)	TUNING LEVEL	(D) 1000kHz 400Hz, 30% mod 26dBu (ANT input)	(B)	1000kHz	VR3 (X05-)	Adjust VR3 and stop at the point where EDI(TUNED) goes on.	

T-76/76L

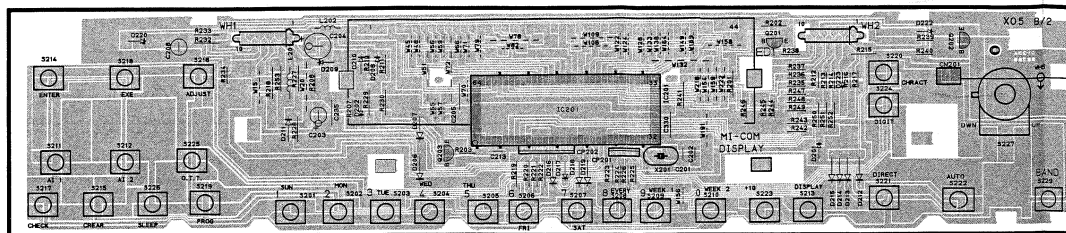
ADJUSTMENT

The T-76 and T-76L don't have a power transformer. Use A-56/76 or RM-90PS to supply power to the T-76/76L. If neither is available, apply AC 16 V to TP12 and TP13 of the tuner unit (X05, A/2).

When turning the power on, short the connector pin of CN 201 (X05-B/2).

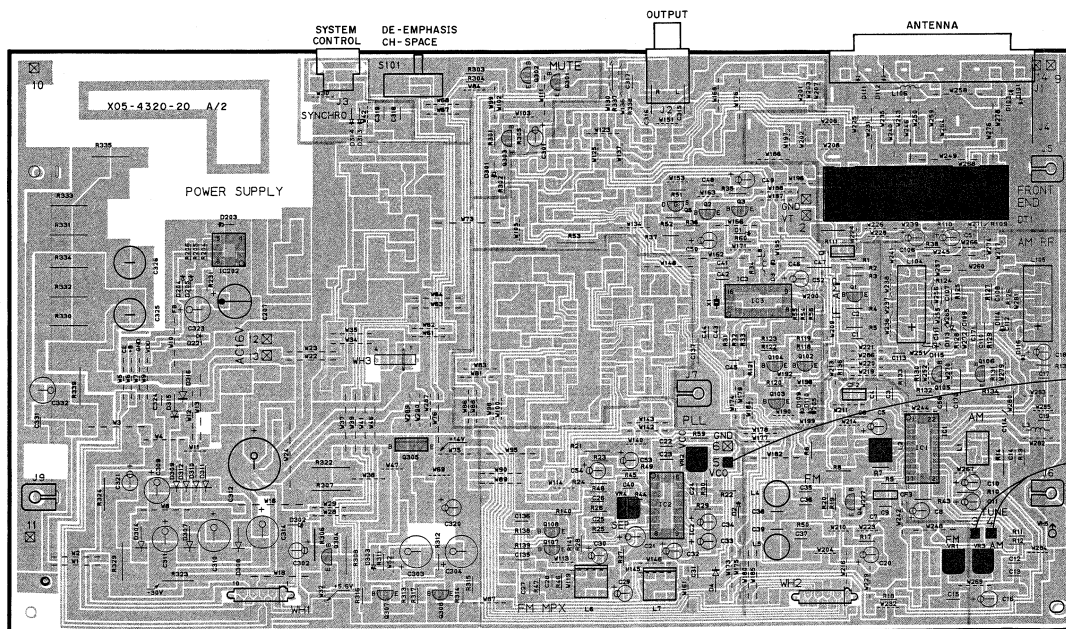


PC BOARD (Component side view)



POWER ON

When turning the power on, short the connector pin of CN201.



(b) VCO : 19.00kHz



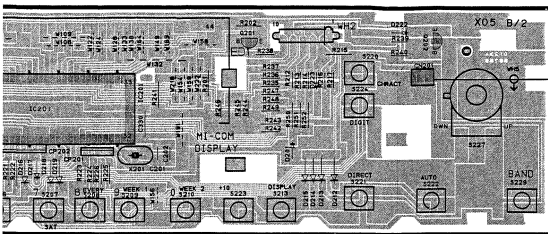
Frequency counter

(a) Discriminator : 0V

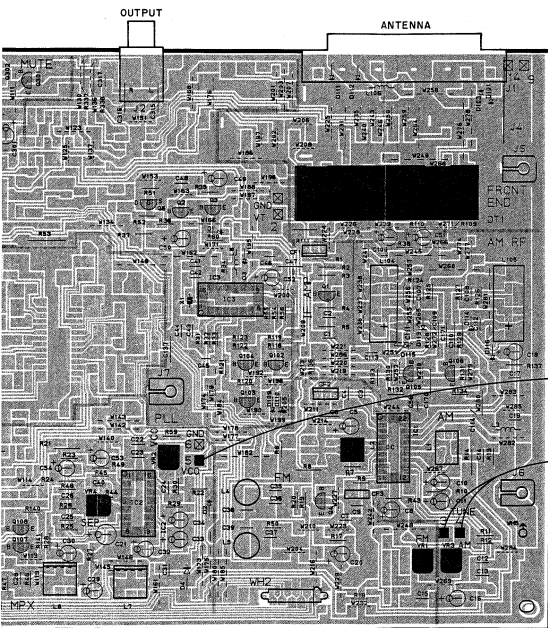


DC voltmeter

WIRING DIAGRAM

**POWER ON**

When turning the power on,
short the connector pin of
CN201.

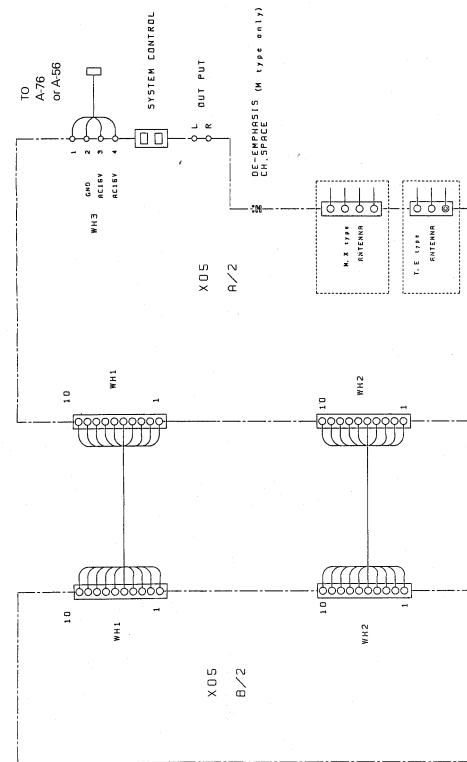


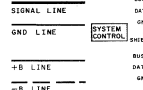
(b) VCO : 19.00kHz

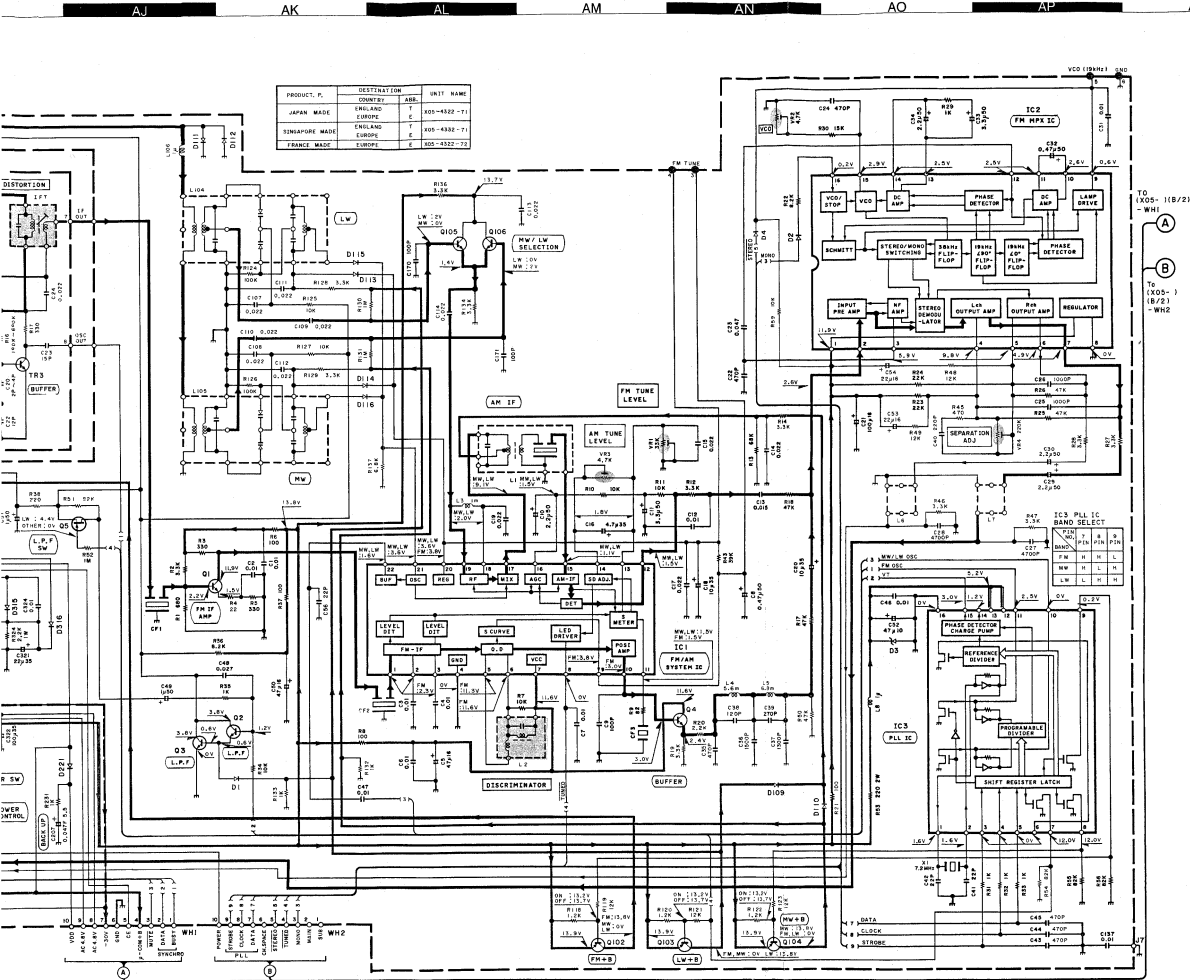
Frequency counter

(a) Discriminator : 0V

DC voltmeter







DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

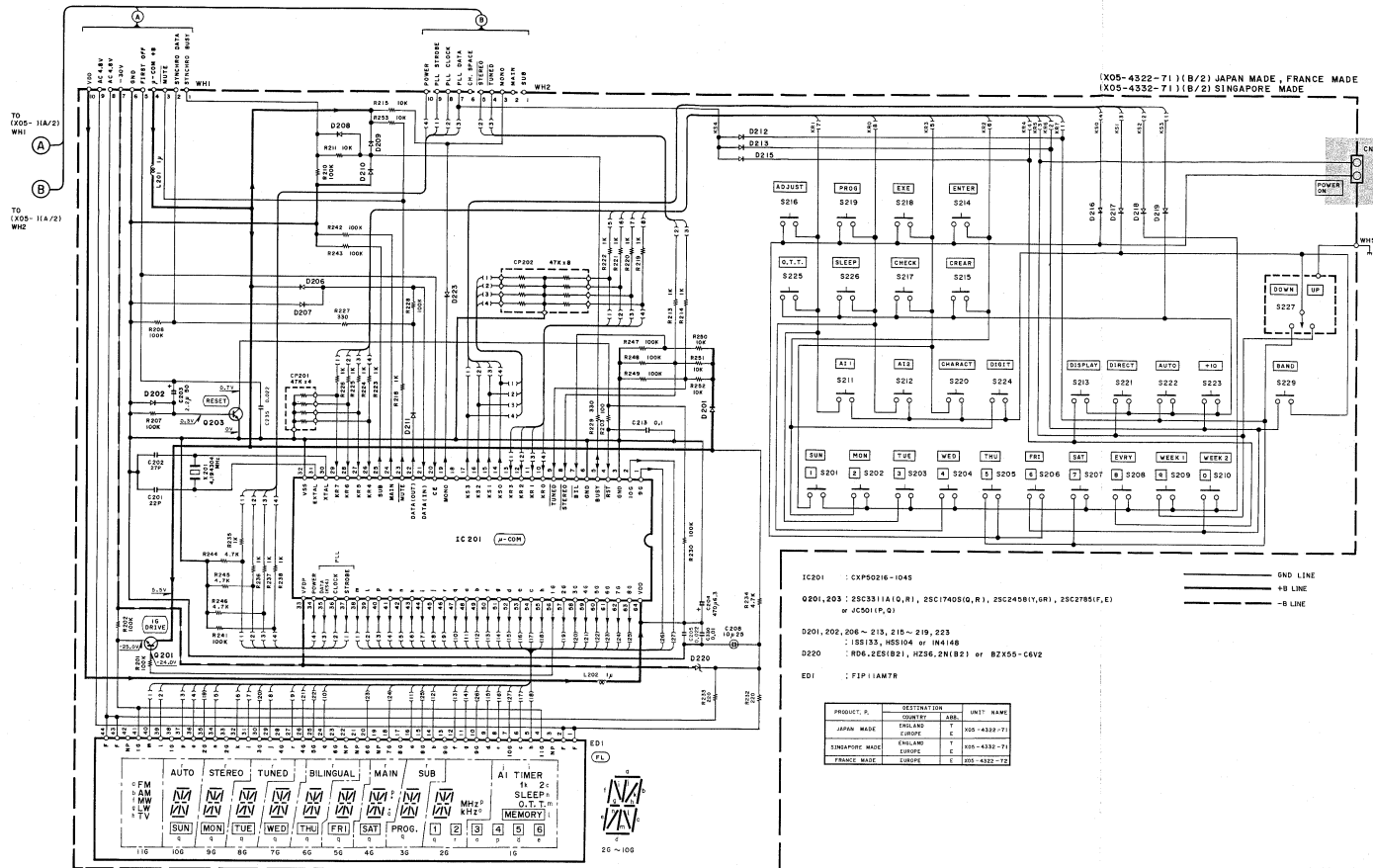
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). **⚠** Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

T-76L(E)(1/2)

Y07-3532-71

T-76L
KENWOOD

When turning the pot
short the connector
CN201.



(X05-4322-71)(B/2) JAPAN MADE , FRANCE MADE
(X05-4332-71)(B/2) SINGAPORE MADE

```

IC201      : CXP50216-1045

Q201,203  : 25C331(A,I,R), 25C1740S(Q,R), 25C2458(Y,R), 25C2785(F,E,
             or JC501(P,Q)

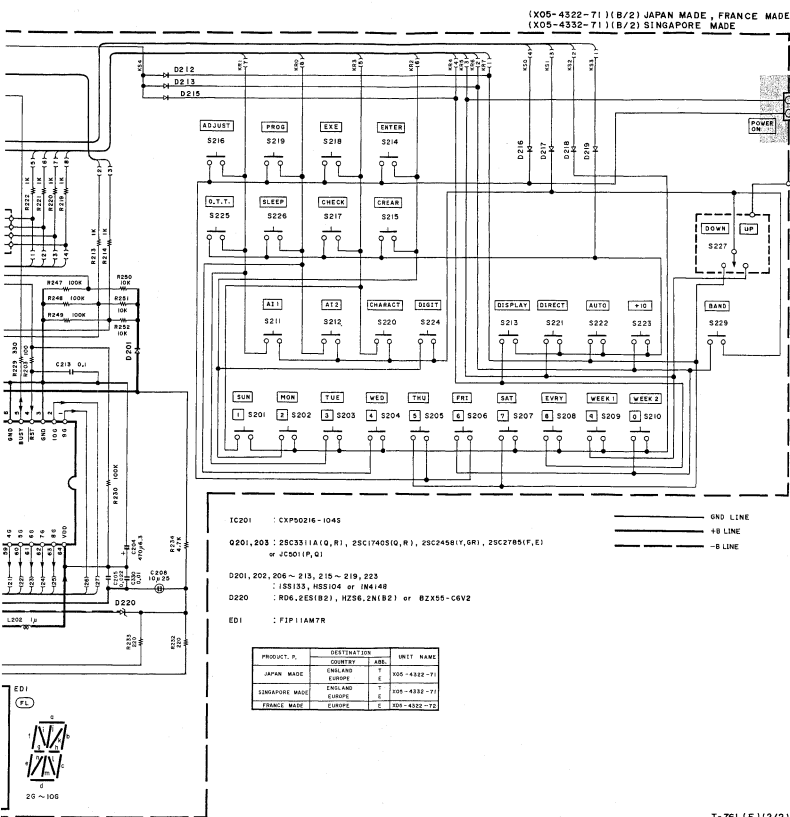
D201,202,206 ~ 213, 215 ~ 219, 223
            : 1SS133, H5S104 or IN4148

D220       : RD6.2E5(B21, HZ56.2N(B2) or BZX55-C6V2

ED1        : FIP11AM7R

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PRODUCT, P.	DESTINATION		UNIT NAME
	COUNTRY	ABB.	
JAPAN MADE	ENGLAND	T	X05 - 4322 - 7
	EUROPE	E	X05 - 4322 - 7
SINGAPORE MADE	ENGLAND	T	X05 - 4332 - 7
	EUROPE	E	X05 - 4332 - 7
FRANCE MADE	EUROPE	E	X05 - 4322 - 7



T-76L(E)(12/2)



JA101
JC301
2SC1845
2SC1923
2SC2003
2SD1302



2SD2012
2SD2374



2SA1048
2SA8335
2SC1740S
2SC2458



2SA1308A
2SC3311A



AN7470



LM7001



BA10393



2SK1163
2SK364



2SA1175
2SC2785



LA126

DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

Y07-3532-71

T-76L
KENWOOD

PARTS LIST

New Parts
Parts without Part No. are not supplied.
Les articles non mentionnés dans le Part No. ne sont pas fournis.
Teile ohne Parts No. werden nicht geliefert.

[illegible]

25

26

New Parts
 Parts without Parts No. are not supplied.
 Les articles non mentionnés dans le Parts No. ne sont pas fournis.
 Teile ohne Parts No. werden nicht geliefert.

[illegible]

25

26

* New Parts
 Parts without Parts No. are not supplied.
 Les articles non mentionnés dans le Parts No. ne sont pas fournis.
 Teile ohne Parts No. werden nicht geliefert.

Ref. No.	Accession No.	Prints No.	Classification	Quantity	Remarks	Notes
655	36	202-0704-65	PRINT	1	FRONT	
656	36	202-1420-35	PRINT	1	FRONT	
657	36	202-1420-34	PRINT	1	FRONT	
658	3A	* K27-4420-04	KAMUJUNING/CHARACTER OF JAPAN	1	KAMUJUNING	
659	1A	202-0704-65	PRINT	1	FRONT	
660	2B	202-0704-65	PRINT	1	FRONT	
661	2B	202-0704-65	PRINT	1	FRONT	
662	2B	202-0704-65	PRINT	1	FRONT	
663	2B	202-0704-65	PRINT	1	FRONT	
664	2B	202-0704-65	PRINT	1	FRONT	
665	2B	202-0704-65	PRINT	1	FRONT	
666	2B	202-0704-65	PRINT	1	FRONT	
667	2B	202-0704-65	PRINT	1	FRONT	
668	2B	202-0704-65	PRINT	1	FRONT	
669	2B	202-0704-65	PRINT	1	FRONT	
670	2B	202-0704-65	PRINT	1	FRONT	
671	2B	202-0704-65	PRINT	1	FRONT	
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766	2B	202-0704-65	PRINT	1	FRONT	
767	2B	202-0704-65	PRINT	1	FRONT	
768	2B	202-0704-65	PRINT	1	FRONT	
769	2B	202-0704-65	PRINT	1	FRONT	
770	2B	202-0704-65	PRINT	1	FRONT	
771	2B	202-0704-65	PRINT	1	FRONT	
772	2B	202-0704-65	PRINT	1	FRONT	
773	2B	202-0704-65	PRINT	1	FRONT	
774	2B	202-0704-65	PRINT	1	FRONT	
775	2B	202-0704-65	PRINT	1	FRONT	
776	2B	202-0704-65	PRINT	1	FRONT	
777	2B	202-0704-65	PRINT	1	FRONT	
778	2B	202-0704-65	PRINT	1	FRONT	
779	2B	202-0704-65	PRINT	1	FRONT	
780	2B	202-0704-65	PRINT	1	FRONT	
781	2B	202-0704-65	PRINT	1	FRONT	
782	2B	202-0704-65	PRINT	1	FRONT	
783	2B	202-0704-65	PRINT	1	FRONT	
784	2B	202-0704-65	PRINT	1	FRONT	
785	2B	202-0704-65	PRINT	1	FRONT	
786	2B	202-0704-65	PRINT	1	FRONT	
787	2B	202-0704-65	PRINT	1	FRONT	
788	2B	202-0704-65	PRINT	1	FRONT	
789	2B	202-0704-65	PRINT	1	FRONT	
790	2B	202-0704-65	PRINT	1	FRONT	
791	2B	202-0704-65	PRINT	1	FRONT	
792	2B	202-0704-65	PRINT	1	FRONT	
793	2B	202-0704-65	PRINT	1	FRONT	
794	2B	202-0704-65	PRINT	1	FRONT	
795	2B	202-0704-65	PRINT	1	FRONT	
796	2B	202-0704-65	PRINT	1	FRONT	
797	2B	202-0704-65	PRINT	1	FRONT	
798	2B	202-0704-65	PRINT	1	FRONT	
799	2B	202-0704-65	PRINT	1	FRONT	
800	2B	202-0704-65	PRINT	1	FRONT	

	USA	Canada
1990	1.0	1.0
1991	1.0	1.0
1992	1.0	1.0
1993	1.0	1.0
1994	1.0	1.0
1995	1.0	1.0
1996	1.0	1.0
1997	1.0	1.0
1998	1.0	1.0
1999	1.0	1.0
2000	1.0	1.0
2001	1.0	1.0
2002	1.0	1.0
2003	1.0	1.0
2004	1.0	1.0
2005	1.0	1.0
2006	1.0	1.0
2007	1.0	1.0
2008	1.0	1.0
2009	1.0	1.0
2010	1.0	1.0
2011	1.0	1.0
2012	1.0	1.0
2013	1.0	1.0
2014	1.0	1.0
2015	1.0	1.0
2016	1.0	1.0
2017	1.0	1.0
2018	1.0	1.0
2019	1.0	1.0
2020	1.0	1.0
2021	1.0	1.0
2022	1.0	1.0
2023	1.0	1.0
2024	1.0	1.0
2025	1.0	1.0
2026	1.0	1.0
2027	1.0	1.0
2028	1.0	1.0
2029	1.0	1.0
2030	1.0	1.0
2031	1.0	1.0
2032	1.0	1.0
2033	1.0	1.0
2034	1.0	1.0
2035	1.0	1.0
2036	1.0	1.0
2037	1.0	1.0
2038	1.0	1.0
2039	1.0	1.0
2040	1.0	1.0
2041	1.0	1.0
2042	1.0	1.0
2043	1.0	1.0
2044	1.0	1.0
2045	1.0	1.0
2046	1.0	1.0
2047	1.0	1.0
2048	1.0	1.0
2049	1.0	1.0
2050	1.0	1.0
2051	1.0	1.0
2052	1.0	1.0
2053	1.0	1.0
2054	1.0	1.0
2055	1.0	1.0
2056	1.0	1.0
2057	1.0	1.0
2058	1.0	1.0
2059	1.0	1.0
2060	1.0	1.0
2061	1.0	1.0
2062	1.0	1.0
2063	1.0	1.0
2064	1.0	1.0
2065	1.0	1.0
2066	1.0	1.0
2067	1.0	1.0
2068	1.0	1.0
2069	1.0	1.0
2070	1.0	1.0
2071	1.0	1.0
2072	1.0	1.0
2073	1.0	1.0
2074	1.0	1.0
2075	1.0	1.0
2076	1.0	1.0
2077	1.0	1.0
2078	1.0	1.0
2079	1.0	1.0
2080	1.0	1.0
2081	1.0	1.0
2082	1.0	1.0
2083	1.0	1.0
2084	1.0	1.0
2085	1.0	1.0
2086	1.0	1.0
2087	1.0	1.0
2088	1.0	1.0
2089	1.0	1.0
2090	1.0	1.0
2091	1.0	1.0
2092	1.0	1.0
2093	1.0	1.0
2094	1.0	1.0
2095	1.0	1.0
2096	1.0	1.0
2097	1.0	1.0
2098	1.0	1.0
2099	1.0	1.0
2100	1.0	1.0

A indicates safety critical components.

* indicates safety critical components.

Country	Europe	McOther Areas
United Kingdom	100	100
Australia	100	100
Other Areas	100	100

L: Scandinavia
 K: USA
 W: Western Eur. (Hawaii)
 E: Europe
 M: Africa
 A: Asia
 S: South America
 O: Other Areas
 * indicates safety critical components

